



- (51) **International Patent Classification:**
G06F 9/445 (2006.01) *G06F 9/44* (2006.01)
- (21) **International Application Number:**
PCT/MY2014/000167
- (22) **International Filing Date:**
5 June 2014 (05.06.2014)
- (25) **Filing Language:** English
- (26) **Publication Language:** English
- (30) **Priority Data:**
PI 2013004385 5 December 2013 (05.12.2013) MY
- (71) **Applicant:** MIMOS BERHAD [MY/MY]; Technology Park Malaysia, 57000 Kuala Lumpur (MY).
- (72) **Inventor:** LEE, Soon Hin; MIMOS BERHAD, Technology Park Malaysia, 57000 Kuala Lumpur (MY).
- (74) **Agent:** MIRANDAH, Patrick; Mirandah Asia (Malaysia) sdn bhd, Suite 3B-19-3, Plaza Sentral, Jalan Stesen Sentral 5, 50470 Kuala Lumpur (MY).
- (81) **Designated States** (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT,

HN, HR, HU, ID, IL, IN, IR, IS, JP, KE, KG, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SA, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

- (84) **Designated States** (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, KM, ML, MR, NE, SN, TD, TG).

Declarations under Rule 4.17:

- as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))
- of inventorship (Rule 4.17(iv))

Published:

- with international search report (Art. 21(3))

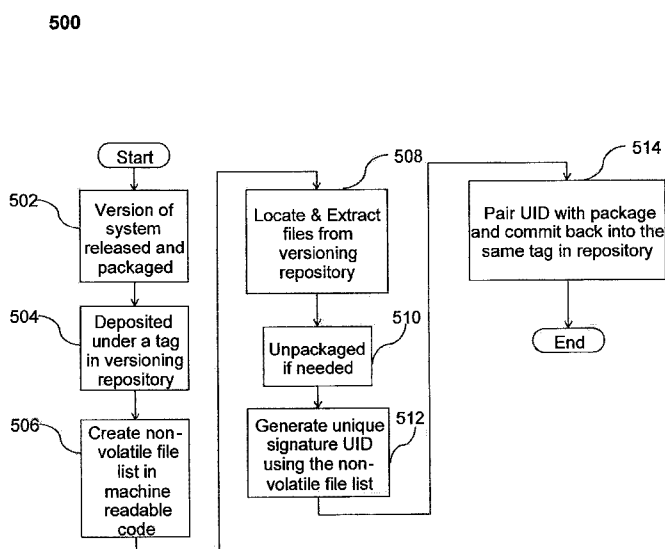
(54) Title: A SYSTEM AND METHOD TO DETERMINE VERSION OF DEPLOYED PACKAGE

FIG. 5.0

(57) Abstract: The present invention provides system and method which provides for a version of a deployed package to be determined and verified against release packages stored in a versioning repository. The system (100) of the present invention to determine version of deployed package comprising at least one release package (102) for locating and extracting deposited package; at least one versioning repository (104) for pairing and committing signature with package; at least one signature generator (106) for generating signature; at least one traversor (108a) for traversing down repository tree from said versioning repository; and at least one comparator (108b) for comparing stored signature with signature generated from deployed system. The present invention combines the features of existing and proven versioning repositories with a signature generator to uniquely identify the release system packages. These signatures are stored in the same tag within the repository and these signatures can be compared against the signature generated from the deployed system using an integrated tool. The distinctiveness of the present invention lies in the creation of a single unique signature for the single release package based on a pre-determined list of non-changeable files.

- 1 -

A SYSTEM AND METHOD TO DETERMINE VERSION OF DEPLOYED PACKAGE**FIELD OF INVENTION**

5 The present invention relates to a system and method to determine version of deployed package. In particular, the invention relates to a system and method which provides for a version of a deployed package to be determined and verified against release packages stored in a versioning repository.

10 BACKGROUND ART

Currently available deployed system relies on control procedures to determine and confirm the version of a deployed system. Verification is executed in one direction from a versioned repository to the deployed environment. Proper and control documentation of
15 the system is maintained separately and requires synchronization. If the documents are not synchronized, it would be very difficult for verification in the reverse direction (i.e. deployed folder back to the versioning repository). The issue of the currently available deployed system drives the need of determining and verifying the version of a deployed system against release packages stored in a versioning repository as proposed in the
20 present invention.

One example of currently available method for verifying a version for each of a plurality of object files is disclosed in United States Patent No. US 7,143,395 B2 entitled "Verifying a Program Version" (hereinafter referred to as the US 395 Patent). In the US
25 395 Patent, a version of each of a plurality of object files is verified by identifying a version of an object file of a plurality of object files. An alert is generated in response to the different version of the object code file found in one or more version of the remaining object code files. The invention as disclosed in the US 395 Patent does not generate a single unique signature for the single release package based on a pre-determined list of
30 non-changeable files as proposed in the present invention. Further, a proven version repository is not utilized for tracking purpose as provided in the present invention which identifies the version of the package used for deployment based on the repository.

- 2 -

Another example as disclosed in an IEEE paper (2001 IEEE) entitled "Design and Implementation of Component Repository for Supporting the Component Based Development Process" by Jung-Eun Cha, Young-Jung Yang, Mun-Sub Song, Hang-Gon Kim suggest a theory for repository construction to support and realize Component Based Development (CBD) process and developed the Component Repository Prototyping System (CRPS) as implementation product of proposal techniques. In the said IEEE paper, component repository is provided as the most important part in Component Based Development (CBD). Further, individual techniques theory for repository construction to support and realize the CBD process is provided and Component Repository Prototyping System (CRPS) is provided for supporting CBD process by managing variety component products classified by each step of component life cycle and domain based on component architecture. The disclosure in the said IEEE paper does not relate to generation of a single unique signature for the single release package based on a pre-determined list of non-changeable files as proposed in the present invention and does not utilize a proven version repository for tracking purpose as proposed in the present invention which is able to identify the version of the package used for deployment based on the repository.

Another mechanism which integrates Use case-based requirements specification into release planning process is disclosed in an IEEE paper (2008 IEEE) entitled "A proposed Method for Release Planning from Use Case-based Requirements Specification" by Ákos Szőke. In the said paper, use case modelling is integrated with release planning objective to form a consistent planning repository. Release planning which addresses the decision related to implementation of a selected requirement's collection in incremental development is provided. The disclosure in the said IEEE paper does not relate to generation of a single unique signature for the single release package based on a pre-determined list of non-changeable files as proposed in the present invention and does not utilize a proven version repository for tracking purpose as proposed in the present invention which is able to identify the version of the package used for deployment based on the repository.

The subject matter claimed herein is not limited to embodiments that solve any disadvantages or that operate only in environments such as those described above.

- 3 -

Rather, this background is only provided to illustrate one exemplary technology area where some embodiments described herein may be practice.

SUMMARY OF INVENTION

The present invention relates to a system and method to determine version of deployed package. In particular, the invention relates to a system and method which provides for a version of a deployed package to be determined and verified against release packages stored in a versioning repository.

One aspect of the invention provides a system (100) to determine version of deployed package. The system comprising at least one release package (102) for locating and extracting deposited package; at least one versioning repository (104) for pairing and committing signature with package; at least one signature generator (106) for generating signature; at least one traversor (108a) for traversing down repository tree from said versioning repository; and at least one comparor (108b) for comparing stored signature with signature generated from deployed system. The at least one signature generator (106) for generating signature further having means to create a single unique signature by combining features of existing and proven versioning repositories by releasing and packaging version of system; depositing in at least one tag in versioning repository; creating non-volatile file list in machine readable code; locating and extracting files from versioning repository; unpackaging the same if required; generating unique signature (UID) using said non-volatile file list; and pairing the generated unique signature (UID) with package and commit back into the same tag in said repository.

Another aspect of the invention provides a method (200) to determine version of deployed package. The method comprising steps of determining version of deployed system against release packages stored in at least one versioning repository (202); creating package signature (204); and verifying version of deployed system package (206). The step for creating package signature further comprises steps of releasing and packaging version of system (502); depositing in at least one tag in versioning repository (504); creating non-volatile file list in machine readable code (506); locating and extracting files from versioning repository (508); unpackaging the same if required (510); generating unique signature (UID) using said non-volatile file list (512); and pairing the generated unique signature (UID) with package and commit back into the same tag in said repository (514).

- 5 -

Yet another aspect of the invention relates to the step for determining version of deployed system against release packages stored in at least one versioning repository (202). For repository package (300), the said step (202) further comprises steps of locating and extracting deposited package from versioning repository (304); rehashing
5 and constructing unique signature (306) based on combination of non-volatile file list (308) and deposited package (304); and pairing and committing constructed signature with package into versioning repository (310). For deployed package (400), the said step (202) further comprises steps of rehashing and constructing unique signature (406) based on combination of non-volatile file list (402) and folder of deployed package (404);
10 traversing down repository tree (410) from said versioning repository (408); comparing stored signature against signature generated from the deployed system (412); and generating and forwarding report to user (414).

Still another aspect of the invention provides for the step of verifying version of deployed
15 system package (206). The said step further comprises step of generating unique signature (UID) of the deployed package (604) from the created non-volatile file list (602); traversing versioning repository and comparing signatures to locate version (606); forwarding report version to user upon locating version of report (610); and generating report or exception if fail to locate version of report (612).

20

The present invention consists of features and a combination of parts hereinafter fully described and illustrated in the accompanying drawings, it being understood that various changes in the details may be made without departing from the scope of the invention or sacrificing any of the advantages of the present invention.

- 6 -

BRIEF DESCRIPTION OF ACCOMPANYING DRAWINGS

To further clarify various aspects of some embodiments of the present invention, a more particular description of the invention will be rendered by references to specific
5 embodiments thereof, which are illustrated in the appended drawings. It is appreciated that these drawings depict only typical embodiments of the invention and are therefore not to be considered limiting of its scope. The invention will be described and explained with additional specificity and detail through the accompanying drawings in which:

10 FIG. 1 illustrates the general architecture of the system of the present invention.

FIG. 2 is a flowchart illustrating the general methodology of the present invention to determine version of deployed package.

15 FIG. 3 is a flowchart illustrating the steps for determining version of deployed system against release packages stored in at least one versioning repository for a repository package.

20 FIG. 4 is a flowchart illustrating the steps for determining version of deployed system against release packages stored in at least one versioning repository for a deployed package.

FIG. 5 is a flowchart illustrating the steps for creating package signature.

25 FIG. 6 is a flowchart illustrating the steps for verifying version of deployed system package.

- 7 -

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

The present invention relates to a system and method to determine version of deployed package. In particular, the invention relates to a system and method which provides for a
5 version of a deployed package to be determined and verified against release packages stored in a versioning repository.

Hereinafter, this specification will describe the present invention according to the preferred embodiments. It is to be understood that limiting the description to the
10 preferred embodiments of the invention is merely to facilitate discussion of the present invention and it is envisioned without departing from the scope of the appended claims.

Referring to FIG. 1.0, a system to determine version of deployed package is illustrated. As illustrated in FIG. 1.0, the system (100) comprising a release package (102) for
15 locating and extracting deposited package; a versioning repository (104) for pairing and committing signature with package; a signature generator (106) for generating signature; a traversor (108a) for traversing down repository tree from said versioning repository; and a comparor (108b) for comparing stored signature with signature generated from deployed system. The signature generator (106) for generating signature further having
20 means to create a single unique signature by combining features of existing and proven versioning repositories by releasing and packaging version of system; depositing in at least one tag in versioning repository; creating non-volatile file list in machine readable code; locating and extracting files from versioning repository; unpackaging the same if required; generating unique signature (UID) using said non-volatile file list; and pairing
25 the generated unique signature (UID) with package and commit back into the same tag in said repository.

A general method (200) of an embodiment of the invention is illustrated in FIG. 2.0 wherein the method (200) to determine version of deployed package of the present
30 invention comprising steps of determining version of deployed system against release packages stored in a versioning repository (202); creating package signature (204); and verifying version of deployed system package (206). A detailed description of the steps to determine version of deployed system against release packages stored in the versioning repository is illustrated in FIGs. 3.0 and 4.0 respectively. As illustrated in FIG.

- 8 -

3.0 for repository package (300); deposited package is first located and extracted from versioning repository (304). Upon locating and extracting deposited package, unique signature is rehashed and constructed (306) based on the combination of non-volatile file list (308) and deposited package (304). The constructed signature is paired and
5 committed with package into versioning repository (310). For deployed package (400), unique signature is rehashed and constructed (406) based on combination of non-volatile file list (402) and folder of deployed package (404). Subsequently, the process traverse down the repository tree (410) from said versioning repository (408) and stored signature is compared against signature generated from the deployed system (412).
10 Thereafter, the report is generated and forwarded to the user (414).

Referring to FIG. 5.0, the steps for creating package signature is illustrated wherein the version of system is first released and packaged (502) and deposited under a tag in a versioning repository (504). Thereafter, non-volatile file list is created in machine
15 readable code (506) and files are located and extracted from versioning repository (508). The extracted files are unpackage if required (510) and unique signature (UID) is generated using said non-volatile file list (512). The generated unique signature (UID) is paired with package and commit back into the same tag in said repository (514). The said signature is generated based on list of files in a release package stored within said
20 versioning repository and list of files in said deployed package and said unique signature (UID) is used to identify version of package.

Referring to FIG. 6.0, the steps for verifying version of deployed system package (206) is illustrated wherein unique signature (UID) of the deployed package is generated (604)
25 from the created non-volatile file list (602). Thereafter, versioning repository is traversed and signatures are compared to locate version (606). The report version is forwarded to user upon locating version of report (610); and report or exception is generated for failure of locating version of report (612). The step for traversing versioning repository and comparing signatures to locate version (606) further validates authenticity of the
30 deployed package.

The present invention combines the features of existing and proven versioning repositories with a signature generator to uniquely identify the release system packages. These signatures are stored in the same tag within the repository and these signatures

- 9 -

can be compared against the signature generated from the deployed system using an integrated tool. The distinctiveness of the present invention lies in the creation of a single unique signature for the single release package based on a pre-determined list of non-changeable files.

5

Unless the context requires otherwise or specifically stated to the contrary, integers, steps or elements of the invention recited herein as singular integers, steps or elements clearly encompass both singular and plural forms of the recited integers, steps or elements.

10

Throughout this specification, unless the context requires otherwise, the word "comprise", or variations such as "comprises" or "comprising", will be understood to imply the inclusion of a stated step or element or integer or group of steps or elements or integers, but not the exclusion of any other step or element or integer or group of steps, elements or integers. Thus, in the context of this specification, the term "comprising" is used in an inclusive sense and thus should be understood as meaning "including principally, but not necessarily solely".

15

20

It will be appreciated that the foregoing description has been given by way of illustrative example of the invention and that all such modifications and variations thereto as would be apparent to persons of skill in the art are deemed to fall within the broad scope and ambit of the invention as herein set forth.

- 10 -

CLAIMS

1. A system (100) to determine version of deployed package comprising:

at least one release package (102) for locating and extracting deposited
package;

at least one versioning repository (104) for pairing and committing
signature with package;

at least one signature generator (106) for generating signature;

at least one traversor (108a) for traversing down repository tree from said
versioning repository; and

at least one comparor (108b) for comparing stored signature with
signature generated from deployed system

characterized in that

the at least one signature generator (106) for generating signature further
having means to create a single unique signature by combining features
of existing and proven versioning repositories by:

releasing and packaging version of system;

depositing in at least one tag in versioning repository;

creating non-volatile file list in machine readable code;

locating and extracting files from versioning repository;

unpackaging the same if required;

generating unique signature (UID) using said non-volatile file list;

and

pairing the generated unique signature (UID) with package and

commit back into the same tag in said repository.

2. A method (200) to determine version of deployed package comprising steps of:

determining version of deployed system against release packages stored
in at least one versioning repository (202);

creating package signature (204); and

verifying version of deployed system package (206)

characterized in that

creating package signature further comprises steps of:

releasing and packaging version of system (502);

- 11 -

- depositing in at least one tag in versioning repository (504);
creating non-volatile file list in machine readable code (506);
locating and extracting files from versioning repository (508);
unpackaging the same if required (510);
5 generating unique signature (UID) using said non-volatile file list (512); and
pairing the generated unique signature (UID) with package and commit back into the same tag in said repository (514).
- 10 3. A method according to Claim 2, wherein determining version of deployed system against release packages stored in at least one versioning repository (202) further comprises steps of:
for repository package (300)
15 locating and extracting deposited package from versioning repository (304);
rehashing and constructing unique signature (306) based on combination of non-volatile file list (308) and deposited package (304); and
pairing and committing constructed signature with package into
20 versioning repository (310)
for deployed package (400)
rehashing and constructing unique signature (406) based on combination of non-volatile file list (402) and folder of deployed package (404);
25 traversing down repository tree (410) from said versioning repository (408);
comparing stored signature against signature generated from the deployed system (412); and
generating and forwarding report to user (414).
- 30 4. A method according to Claim 2, wherein verifying version of deployed system package (206) further comprises step of:
generating unique signature (UID) of the deployed package (604) from the created non-volatile file list (602);

- 12 -

traversing versioning repository and comparing signatures to locate version (606);

forwarding report version to user upon locating version of report (610);
and

5 generating report or exception if fail to locate version of report (612).

10 5. A method according to Claim 2, wherein generating unique signature (UID) using said non-volatile file list (512); said signature is generated based on list of files in a release package stored within said versioning repository and list of files in said deployed package.

6. A method according to Claim 2, wherein said unique signature (UID) is used to identify version of package.

15 7. A method according to Claim 4, wherein traversing versioning repository and comparing signatures to locate version (606) further comprising validating authenticity of the deployed package.

100

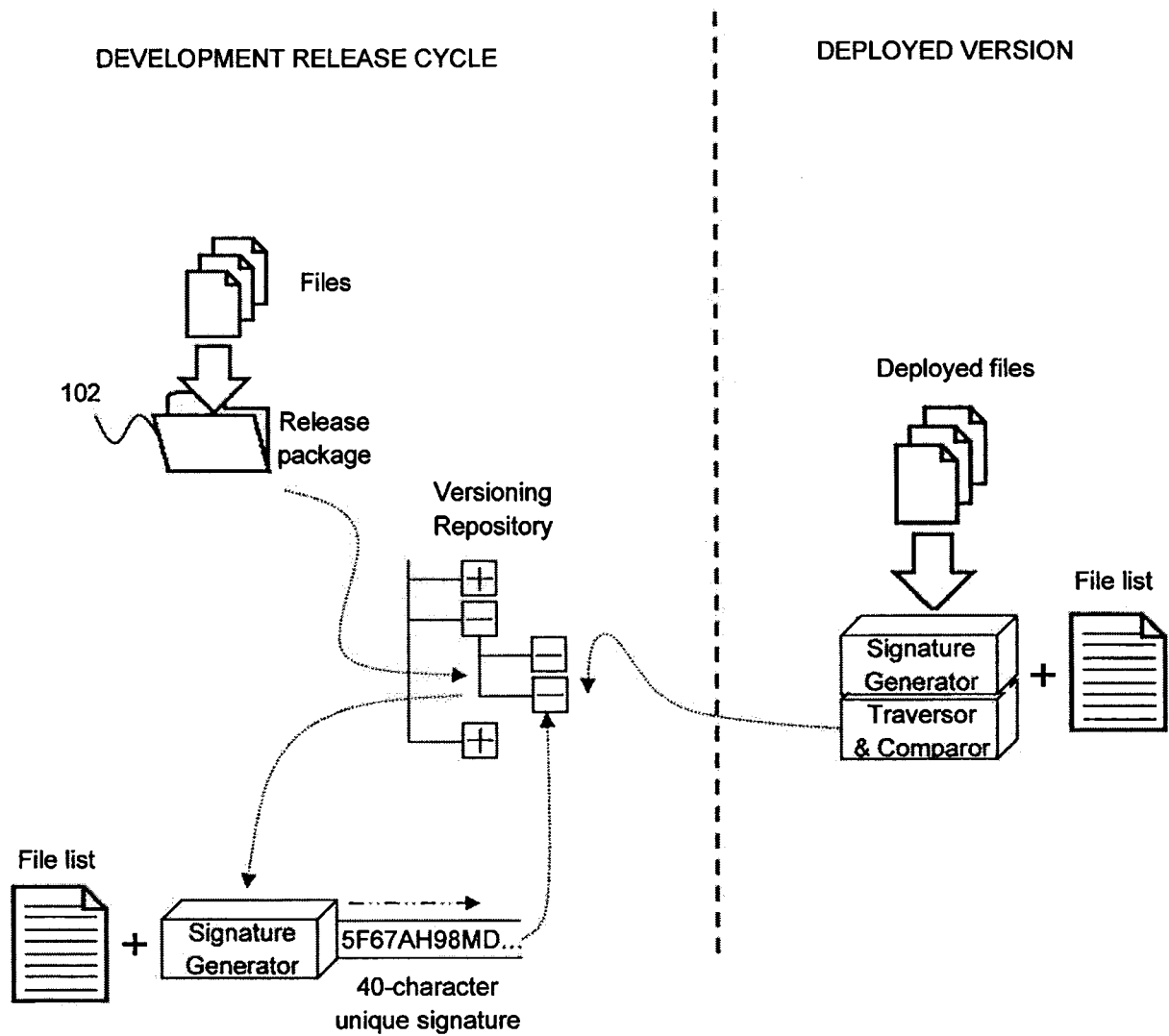


FIG. 1.0

200

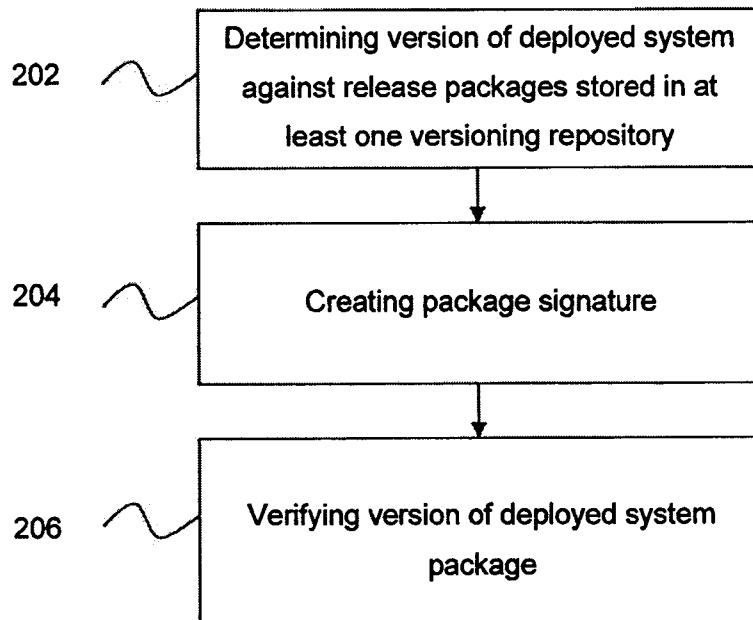


FIG. 2.0

300

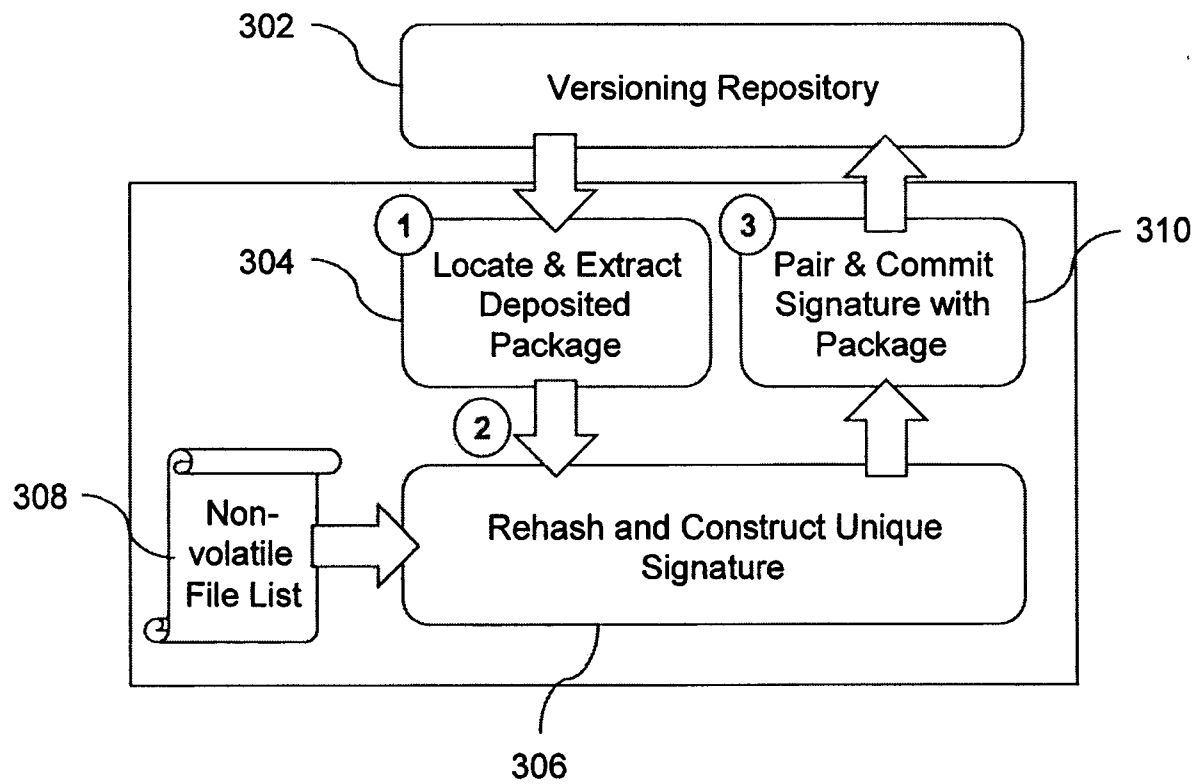


FIG. 3.0

400

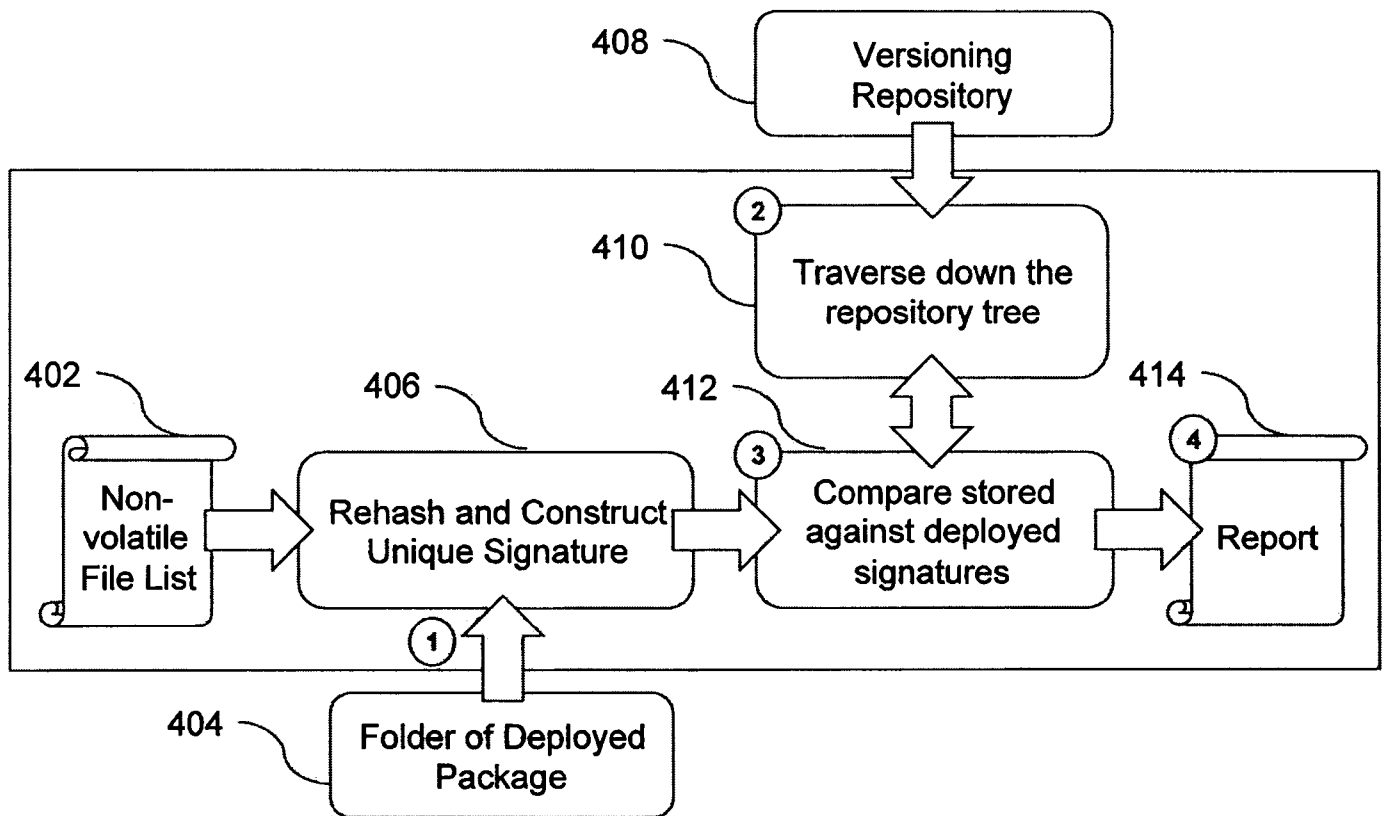


FIG. 4.0

500

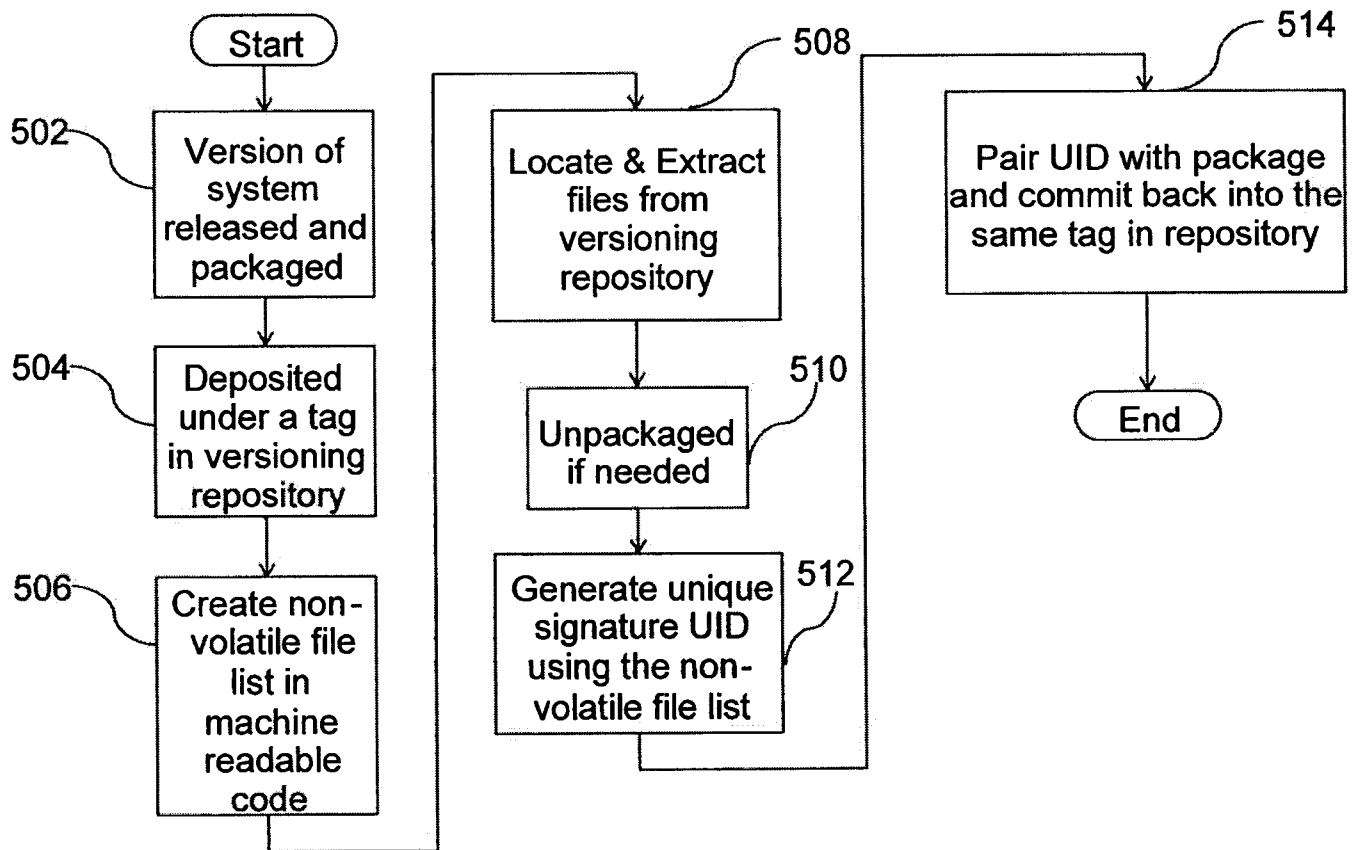
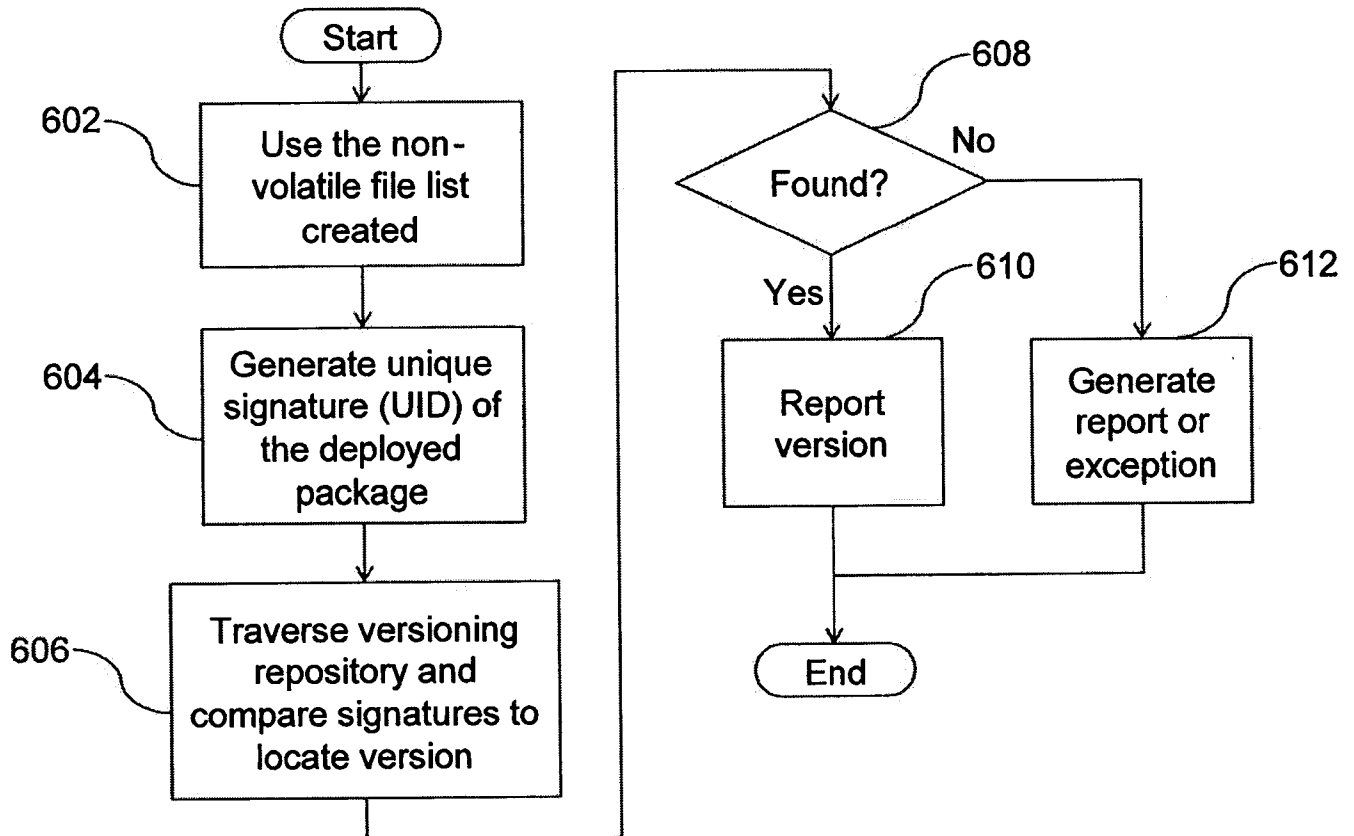


FIG. 5.0

600**FIG. 6.0**

INTERNATIONAL SEARCH REPORT

International application No

PCT/MY2014/000167

A. CLASSIFICATION OF SUBJECT MATTER

INV. G06F9/445 G06F9/44
ADD.

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

G06F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2009/064122 A1 (BIELSKI JULIANNE [US]) 5 March 2009 (2009-03-05) paragraph [0006] paragraph [0026] paragraph [0028] paragraph [0032] paragraph [0030] paragraph [0033] -----	1-7



Further documents are listed in the continuation of Box C.



See patent family annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search

17 November 2014

Date of mailing of the international search report

26/11/2014

Name and mailing address of the ISA/

European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040,
Fax: (+31-70) 340-3016

Authorized officer

Ebert, Werner

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/MY2014/000167

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2009064122 A1	05-03-2009	US 2009064122 A1	05-03-2009
		US 2012266153 A1	18-10-2012
